



United States Department of the Interior

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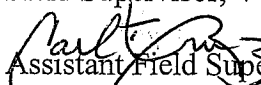


IN REPLY REFER TO:
PAS1503.1665.6426

October 20, 2006

Memorandum

To: Field Supervisor, Ventura Fish and Wildlife Office, California

From:  Assistant Field Supervisor, Mojave/Great Basin Desert Division, Ventura Fish and Wildlife Office, Ventura, California

Subject: Intra-Service Biological Opinion for the Issuance of Incidental Take Permit TE133476-0 for the Desert Tortoise at the Proposed Joshua Tree Recreational Campground Site in the Community of Joshua Tree, San Bernardino County, California (1-8-06-FW-3)

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of your proposal to issue an incidental take permit for the development and operation of a campground with supporting recreational facilities in San Bernardino County. At issue are the effects of the issuance of the incidental take permit and subsequent development and operation of the campground on the federally threatened desert tortoise (*Gopherus agassizii*). The proposed term of the incidental take permit is 30 years. This document was prepared in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act).

This biological opinion is based on information in the habitat conservation plan prepared by Circle Mountain Biological Consultants and Yacoubian Law Offices (2006) for the proposed facility and various reports and publications. A complete administrative record of this consultation is on file at the Service's Ventura Fish and Wildlife Office.

The proposed action is not located within the boundaries of critical habitat of the desert tortoise and will not affect critical habitat. Consequently, we will not discuss critical habitat again in this biological opinion.

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BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Description and Operation of the Proposed Facility

The proposed campground would be developed and operated on 13.8 acres of the 314.6-acre property and would be built in 2 phases. During Phase I, the proponent would install 11 tent campsites, therapeutic salt water pools, a fitness center, massage treatment rooms, and a reception/restaurant building. Phase II would begin from 3 to 5 years after Phase 1. It would comprise 11 additional tent sites, a bunkhouse for additional lodging, expansion of the spa area, a photo studio, stables, an outdoor theater, a general store, a meeting hall, a dining room, a photo gallery, ranger's station, maintenance buildings, and a greenhouse. Table 1 of the habitat conservation plan (Circle Mountain Biological Consultants and Yacoubian Law Offices 2006) provides acreages for various components of the two phases.

At full operation, the proponent anticipates that a maximum of 200 persons may be on-site at any given time. Vehicle use will be restricted to the main entrance road leading to the parking area. Trail use within the campground will be limited to pedestrians, electric golf carts, mountain bikes, horses, and by service and emergency response vehicles, when necessary. The habitat conservation plan (Circle Mountain Biological Consultants and Yacoubian Law Offices 2006) provides a more detailed description of the proposed campground.

Measures Proposed to Minimize Adverse Effects to Desert Tortoises

JAT Associates has proposed to implement numerous measures to minimize the effects of the development and operation of the campground on the desert tortoise. These measures include, but are not limited to: relocating permanent structures to areas of no or low-density desert tortoise sign; realigning the proposed access road to correspond to an existing road; relocating the entrance station and access trails out of washes; installing fences to exclude desert tortoises from the road and around campsites; conducting various educational activities; and moving desert tortoises from harm's way during construction. The habitat conservation plan (Circle Mountain Biological Consultants and Yacoubian Law Offices 2006) provides a more detailed description of the measures that JAT Associates have proposed to minimize the effects of the campground on desert tortoises.

Measures Proposed to Mitigate Adverse Effects to Desert Tortoises

JAT Associates has proposed to install a perimeter fence, restore disturbed habitat on-site, remove debris from the property, and eliminate illegal off-highway vehicle use, dumping, and shooting. Approximately 13.8 acres of the property will be conserved in perpetuity and managed for the desert tortoise. JAT Associates has chosen to manage an additional 287 acres to conserve habitat of the desert tortoise. The habitat conservation plan (Circle Mountain Biological

Consultants and Yacoubian Law Offices 2006) provides a more detailed description of the measures that JAT Associates have proposed to mitigate the effects of the campground on desert tortoises.

STATUS OF THE DESERT TORTOISE

Basic Ecology of the Desert Tortoise

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mojave desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from 2 to 8 inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986).

Desert tortoises may spend more time in washes than in flat areas outside of washes; Jennings (1997) notes that, between March 1 and April 30, desert tortoises "spent a disproportionately longer time within hill and washlet strata" and, from May 1 through May 31, hills, washlets, and washes "continued to be important." Jennings' paper does not differentiate between the time desert tortoises spent in hilly areas versus washes and washlets; however, he notes that, although washes and washlets comprised only 10.3 percent of the study area, more than 25 percent of the plant species on which desert tortoises fed were located in these areas. Luckenbach (1982) states that the "banks and berms of washes are preferred places for burrows;" he also recounts an incident in which 15 desert tortoises along 0.12 mile of wash were killed by a flash flood.

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend most of their time in the remainder of the year in burrows, escaping the extreme conditions of the desert; however, recent work has demonstrated that they can be active at any time of the year. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994).

Food resources for desert tortoises are dependent on the availability and nutritional quality of annual and perennial vegetation, which is greatly influenced by climatic factors, such as the timing and amount of rainfall, temperatures, and wind (Beatley 1969, 1974, Congdon 1989,

Karasov 1989, and Polis 1991 in Avery 1998). In the Mojave Desert, these climatic factors are typically highly variable; this variability can limit the desert tortoise's food resources.

Desert tortoises will eat many species of plants. However, at any time, most of their diet often consists of a few species (Nagy and Medica 1986 and Jennings 1993 in Avery 1998). Additionally, their preferences can change during the course of a season (Avery 1998) and over several seasons (Esque 1994 in Avery 1998). Possible reasons for desert tortoises to alter their preferences may include changes in nutrient concentrations in plant species, the availability of plants, and the nutrient requirements of individual animals (Avery 1998). In Avery's (1998) study in the Ivanpah Valley, desert tortoises consumed primarily green annual plants in spring; they ate cacti and herbaceous perennials once the winter annuals began to disappear. Medica et al. (1982 in Avery 1998) found that desert tortoises ate increased amounts of green perennial grass when winter annuals were sparse or unavailable; Avery (1998) found that desert tortoises rarely ate perennial grasses.

Desert tortoises can produce from one to three clutches of eggs per year. On rare occasions, clutches can contain up to 15 eggs; most clutches contain 3 to 7 eggs. Multi-decade studies of the Blanding's turtle (*Emydoidea blandingii*), which, like the desert tortoise, is long lived and matures late, indicate that approximately 70 percent of the young animals must survive each year until they reach adult size; after this time, annual survivorship exceeds 90 percent (Congdon et al. 1993). Research has indicated that 50 to 60 percent of young desert tortoises typically survive from year to year, even in the first and most vulnerable year of life. We do not have sufficient information on the demography of the desert tortoise to determine whether this rate is sufficient to maintain viable populations; however, it does indicate that maintaining favorable habitat conditions for small desert tortoises is crucial for the continued viability of the species.

Desert tortoises typically hatch from late August through early October. At the time of hatching, the desert tortoise has a substantial yolk sac; the yolk can sustain them through the fall and winter months until forage is available in the late winter or early spring. However, neonates will eat if food is available to them at the time of hatching; when food is available, they can reduce their reliance on the yolk sac to conserve this source of nutrition. Neonate desert tortoises use abandoned rodent burrows for daily and winter shelter; these burrows are often shallowly excavated and run parallel to the surface of the ground.

Neonate desert tortoises emerge from their winter burrows as early as late January to take advantage of freshly germinating annual plants; if appropriate temperatures and rainfall are present, at least some plants will continue to germinate later in the spring. Freshly germinating plants and plant species that remain small throughout their phenological development are important to neonate desert tortoises because their size prohibits access to taller plants. As plants grow taller during the spring, some species become inaccessible to small desert tortoises.

Neonate and juvenile desert tortoises require approximately 12 to 16 percent protein content in their diet for proper growth. Desert tortoises, both juveniles and adults, seem to selectively forage for particular species of plants with favorable ratios of water, nitrogen (protein), and

potassium. The potassium excretion potential model (Ofstedal 2001) predicts that, at favorable ratios, the water and nitrogen allow desert tortoises to excrete high concentrations of potentially toxic potassium, which is abundant in many desert plants. Ofstedal (2001) also reports that variation in rainfall and temperatures cause the potassium excretion potential index to change annually and during the course of a plant's growing season. Therefore, the changing nutritive quality of plants, combined with their increase in size, further limits the forage available to small desert tortoises to sustain their survival and growth.

In summary, the ecological requirements and behavior of neonate and juvenile desert tortoises are substantially different than those of sub adults and adults. Smaller desert tortoises use abandoned rodent burrows, which are typically more fragile than the larger ones constructed by adults. They are active earlier in the season. Finally, small desert tortoises rely on smaller annual plants with greater protein content to be able to gain access to food and to grow, respectively.

Status of the Desert Tortoise

The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California. On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 *Federal Register* 32326). In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 *Federal Register* 12178).

The desert tortoise was listed in response to loss and degradation of habitat caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The loss of individual desert tortoises to increased predation by common ravens (*Corvus corax*), collection by humans for pets or consumption, collisions with vehicles on paved and unpaved roads, and mortality resulting from diseases also contributed to the Service's listing of this species.

The following paragraphs provide general information on the results of efforts to determine the status and trends of desert tortoise populations across a large portion of its range; we present information on the status of the desert tortoise within the action area in the Environmental Baseline section of this biological opinion. We have grouped these paragraphs by recovery unit and critical habitat unit; we will describe these units in more detail later in this biological opinion.

Before entering into a discussion of the status and trends of desert tortoise populations across its range, a brief discussion of the methods of estimating the numbers of desert tortoises would be useful. Three primary methods have been widely used: permanent study plots, triangular transects, and line distance sampling.

Generally, permanent study plots are defined areas that are visited at roughly 4-year intervals to determine the numbers of desert tortoises present. Desert tortoises found on these plots during the spring surveys were registered; that is, they were marked so they could be identified individually during subsequent surveys. Between 1971 and 1980, 27 plots were established in California to study the desert tortoise; 15 of these plots were used by the Bureau to monitor desert tortoises on a long-term basis (Berry 1999). Range-wide, 49 plots have been used at one time or another to attempt to monitor desert tortoises (Tracy et al. 2004).

Triangular transects are used to detect sign (i.e., scat, burrows, footprints, etc.) of desert tortoises. The number of sign is then correlated with standard reference sites, such as permanent study plots, to allow the determination of density estimates.

Finally, based on recommendations contained in the recovery plan, the Service has been coordinating an effort to determine trends in the number of desert tortoises that occur in each recovery unit. This effort, which is called line-distance sampling, relies on detecting live desert tortoises along transects during the spring. Based on the distance of the desert tortoise from the centerline of the transect, the length of the transect, and a calculation of what percentage of the animals in the area were likely to have been above ground and visible to surveyors during the time the transect was walked, an estimation of the density can be made. Each of these methods has various strengths and weaknesses; the information we present on the density of desert tortoises across the range and in the action area is based on these methods of collecting data.

Note that, when reviewing the information presented in the following sections, determining the number of desert tortoises over large areas is extremely difficult. The report prepared by the Desert Tortoise Recovery Plan Assessment Committee (Tracy et al. 2004) acknowledges as much. Desert tortoises spend much of their lives underground or concealed under shrubs, are not very active in years of low rainfall, and are distributed over a wide area in several different types of habitat. Other factors, such as the inability to sample on private lands and rugged terrain, further complicate sampling efforts. Consequently, the topic of determining the best way to estimate the abundance of desert tortoises has generated many discussions over the years. As a result of this difficulty, we cannot provide concise estimations of the density of desert tortoises in each recovery unit or desert wildlife management area that have been made in a consistent manner.

Given the difficulty in determining the density of desert tortoises over large areas, the reader needs to understand fully that the differences in density estimates in the recovery plan and those derived from subsequent sampling efforts may not accurately reflect on-the-ground conditions. Despite this statement, the reader should also be aware that the absence of live desert tortoises and the presence of carcasses over large areas of some desert wildlife management areas provide at least some evidence that desert tortoise populations seem to be in a downward trend in some regions.

Upper Virgin River Recovery Unit

The Upper Virgin River Recovery Unit is located in the northeastern most portion of the range of the desert tortoise; the Red Cliffs Reserve was established as a conservation area within this critical habitat unit. The recovery plan states that desert tortoises occur in densities of up to 250 adult animals per square mile within small areas of this recovery unit; overall, the area supports a mosaic of areas supporting high and low densities of desert tortoises (Service 1994). We have summarized the information in this paragraph from a report by the Utah Division of Wildlife Resources (McLuckie et al. 2003). The Utah Division of Wildlife Resources has intensively monitored desert tortoises, using a line-distance sampling, since 1998. Monitoring in 2003 indicated that the density of desert tortoises was approximately 44 per square mile throughout the reserve. This density represents a 41 percent decline since monitoring began in 1998. The report notes that the majority of desert tortoises that died within one year (n=64) were found in areas with relatively high densities; the remains showed no evidence of predation. Upper respiratory tract disease has been observed in this population; the region also experienced a drought from 1999 through 2002, with 2002 being the driest year. McLuckie et al. (2003) attribute the primary cause of the die-off to drought, but note that disease, habitat degradation, direct mortality of animals, and predation by domestic dogs and common ravens were also factors in the decline.

Northeastern Mojave Recovery Unit

The Northeastern Mojave Recovery Unit is located to the southwest of the Upper Virgin River Recovery Unit and extends through Nevada and into California in Ivanpah Valley. Several critical habitat units and four desert wildlife management areas are located within this recovery unit. Tracy et al. (2004) note that densities of adult desert tortoises for the overall region do not show a statistical trend over time.

The Beaver Dam Slope Desert Wildlife Management Area covers portions of Nevada, Utah, and Arizona; it is located to the southwest of the Red Cliffs Reserve. Based on various methods, the recovery plan estimates the density of desert tortoises in this desert wildlife management area as being from 5 to 56 animals per square mile (Service 1994). McLuckie et al. (2001) estimated the density in 2001 to be approximately 7.9 reproductive desert tortoises per square mile, using a distance sampling method. However, they also note several problems with the sampling effort, including too few transects and transects placed in habitat types not normally inhabited by desert tortoises; we also note that, as described in the previous paragraph, the survey occurred during a year of lower-than-average rainfall, which would decrease activity levels of desert tortoises and make them more difficult to detect. The encounter rate during this survey was so low that the precision level of the results is low; other monitoring plots, from earlier years, showed higher density estimates.

The Gold Butte-Pakoon Desert Wildlife Management Area covers portions of Nevada and Arizona, generally south of the Beaver Dam Slope Desert Wildlife Management Area. The recovery plan states that densities of desert tortoises in this recovery unit vary from 5 to 56 animals per square mile (Service 1994).

The Mormon Mesa Desert Wildlife Management Area is located entirely in Nevada, generally west and northwest of the Beaver Dam Slope and Gold Butte-Pakoon desert wildlife management areas, respectively. The recovery plan states that densities of desert tortoises in this recovery unit vary from 41 to 87 sub adult and adult animals per square mile (Service 1994).

The Coyote Springs Desert Wildlife Management Area is located entirely in Nevada, generally west of the Mormon Mesa Desert Wildlife Management Area and east of the Desert National Wildlife Refuge. The recovery plan states that densities of desert tortoises in this recovery unit vary from 0 to 90 adult animals per square mile (Service 1994). Kernel analysis for the Coyote Springs Desert Wildlife Management Area showed areas where the distributions of carcasses and living desert tortoises do not overlap (Tracy et al. 2004); this scenario is indicative of a higher than average rate of mortality. (The Desert Tortoise Recovery Plan Assessment Committee used a kernel analysis to examine the distribution of live desert tortoises and carcasses over large areas of the range of the species (Tracy et al. 2004). The intent of this analysis is to determine where large areas with numerous carcasses do not overlap large areas with live animals. Regions where the areas of carcasses do not overlap areas of live animals likely represent recent die-offs or declines in desert tortoise populations.) Because permanent study plots for this region were discontinued after 1996, recent declines in numbers would not be reflected in the kernel analysis if they had occurred.

The Ivanpah Desert Wildlife Management Area lies east of the Mojave National Preserve and covers approximately 36,795 acres. It is contiguous with National Park Service lands; note that the National Park Service did not designate desert wildlife management areas within the Mojave National Preserve because it considers that all of its lands are managed in a manner that is conducive to the recovery of the desert tortoise. The permanent study plot in the Ivanpah Valley is located within the Mojave National Preserve and provides information on the status of desert tortoises in this general region. Data on desert tortoises on this permanent study plot were collected in 1980, 1986, 1990, and 1994; the densities of desert tortoises of all sizes per square mile were 386, 393, 249, and 164, respectively (Berry 1996). (Numerous data sets are collected from the study plots and various statistical analyses conducted to provide information on various aspects of trends. We cannot, in this biological opinion, provide all of this information; therefore, we have selected the density of desert tortoises of all sizes per square mile to attempt to indicate trends.) The number of juvenile and immature desert tortoises on the study plot declined, although the number of adult animals remained fairly constant. The notes accompanying this report indicated that the "ill juvenile and dead adult male (desert) tortoises salvaged for necropsy contained contaminants;" it also cited predation by common ravens and the effects of cattle grazing as causative factors in the decline in the number of juvenile and immature desert tortoises on the study plot (Berry 1996). In 2002, workers found 55 desert tortoises on this plot; this number does not represent a density estimate (Berry 2005).

Eastern Mojave Recovery Unit

The Eastern Mojave Recovery Unit extends from west of Clark Mountain, south through the Mojave National Preserve, and east into southern Nevada. Within this recovery unit, the Bureau

designated the Shadow Valley and Piute-Fenner desert wildlife management areas within California and the Piute-El Dorado Desert Wildlife Management Area in Nevada. The Shadow Valley Desert Wildlife Management Area, which occupies approximately 101,355 acres, lies north of Interstate 15 and west of the Clark Mountains. The Mojave National Preserve is located to the south of the interstate. Data on desert tortoises on a permanent study plot in this area were collected in 1988 and 1992; the densities of desert tortoises of all sizes per square mile were 50 and 58, respectively (Berry 1996). Although these data seem to indicate a slight increase in the number of desert tortoises, in 2002, workers found five desert tortoises on this plot; this number does not represent a density estimate (Berry 2005). Some signs of shell disease have been observed in the population in recent years (Bureau 2002).

The Bureau's Piute-Fenner Desert Wildlife Management Area lies to the east of the southeast portion of the Mojave National Preserve and is contiguous with National Park Service lands. It occupies approximately 173,850 acres. The Goffs permanent study plot, which is located within the Mojave National Preserve, provides information on the status of desert tortoises in this general region. Data on desert tortoises on this permanent study plot were collected in 1980, 1990, and 1994; Berry (1996) estimated the densities of desert tortoises of all sizes at approximately 440, 362, and 447 individuals per square mile, respectively. As Berry (1996) noted, these data seem to indicate that this area supported "one of the more stable, high density populations" of desert tortoises within the United States. Berry (1996) also noted that "a high proportion of the animals (had) shell lesions." In 2000, only 30 live desert tortoises were found; Berry (2000) estimated the density of desert tortoises at approximately 88 animals per square mile. The shell and skeletal remains of approximately 393 desert tortoises were collected; most of these animals died between 1994 and 2000. Most of the desert tortoises exhibited signs of shell lesions; three salvaged desert tortoises showed abnormalities in the liver and other organs and signs of shell lesions. None of the three salvaged desert tortoises tested positive for upper respiratory tract disease.

The Piute-Eldorado Desert Wildlife Management Area is located entirely in southern Nevada and is contiguous with California's Piute-Fenner Desert Wildlife Management Area. Based on various methods, the recovery plan estimates the density of desert tortoises in this desert wildlife management area as being from 40 to 90 adults per square mile (Service 1994). A kernel analysis of the results of distance sampling data from 2001 depicted large areas where only carcasses were detected (Tracy et al. 2004). Only six live desert tortoises were encountered in approximately 103 miles of transects during this sampling effort; this encounter rate is very low.

Northern Colorado Recovery Unit

The Northern Colorado Recovery Unit extends from Interstate 40 south, almost to Interstate 10 and from the eastern portions of Joshua Tree National Park east to the Colorado River; it is located immediately south of the Eastern Mojave Recovery Unit. The 874,843-acre Chemehuevi Desert Wildlife Management Area, which is managed by the Bureau, is the sole conservation area for the desert tortoise in this recovery unit.

Two permanent study plots are located within this desert wildlife management area. At the Chemehuevi Valley and Wash plot, 257 and 235 desert tortoises were registered in 1988 and 1992, respectively (Berry 1999). During the 1999 spring survey, only 38 live desert tortoises were found. The shell and skeletal remains of at least 327 desert tortoises were collected; most, if not all, of these animals died between 1992 and 1999. The frequency of shell lesions and nutritional deficiencies appeared to be increasing and may be related to the mortalities.

The Upper Ward Valley permanent study plot was surveyed in 1980, 1987, 1991, and 1995; Berry (1996) estimated the densities of desert tortoises of all sizes at approximately 437, 199, 273, and 447 individuals per square mile, respectively. In 2002, workers found 17 desert tortoises on this plot; this number does not represent a density estimate (Berry 2005).

Eastern Colorado Recovery Unit

The Eastern Colorado Recovery Unit, which is located immediately south of the Northern Colorado Recovery Unit, extends from just north of Interstate 10 south to the Mexico border near Yuma, Arizona; the Salton Sink and Imperial Valley form the western edge of this recovery unit, which extends east to the Colorado River. The Chuckwalla Desert Wildlife Management Area, which covers 818,685 acres, is the sole conservation area for the desert tortoise in this recovery unit. The Marine Corps (Chocolate Mountains Aerial Gunnery Range), Bureau, and National Park Service (Joshua Tree National Park) manage the Federal lands in this recovery unit and desert wildlife management area. Two permanent study plots are located within this desert wildlife management area.

At the Chuckwalla Bench plot, Berry (1996) calculated approximate densities of 578, 396, 167, 160, and 182 desert tortoises per square mile in 1979, 1982, 1988, 1990, and 1992, respectively. In 1997, workers found 52 desert tortoises on this plot; this number does not represent a density estimate (Berry 2005). At the Chuckwalla Valley plot, Berry (1996) calculated approximate densities of 163, 181, and 73 desert tortoises per square mile in 1980, 1987, and 1991, respectively. Tracy et al. (2004) concluded that these data show a statistically significant decline in the number of adult desert tortoises over time; they further postulate that the decline on the Chuckwalla Bench plot seemed to be responsible for the overall significant decline within the recovery unit.

Western Mojave Recovery Unit

Desert tortoises occur over large areas within the Western Mojave Recovery Unit. They occur as far north as Olancho and the northern Panamint Valley south to the boundary of Joshua Tree National Park; desert tortoises also occur from the lower foothills of the southern Sierra Nevada and Tehachapi Mountains in the west east to Death Valley and the eastern side of Joshua Tree National Park. Although desert tortoises were historically widespread in the western Mojave Desert, their distribution within this region was not uniform. For example, desert tortoises likely occurred at low densities in the juniper woodlands of the western Antelope Valley and in the sandier habitats in the Mojave River valley. They were also likely largely absent from the higher

elevations of the Ord and Newberry mountains and from playas and the areas immediately surrounding these dry lakes.

The recovery plan for the desert tortoise considered the Western Mojave Recovery Unit to be one of the most threatened units (Service 1994). Desert tortoises in this recovery unit continue to face numerous threats. Predation by common ravens and feral dogs, mortality on paved and unpaved roads, vandalism, and poaching continue to cause loss of individuals. The cause or causes of mortality in many individuals cannot be determined; drought, one or more diseases, and physiological stress may be factors. Appendix L of the final environmental impact report and statement for the West Mojave Plan (Bureau et al. 2005) notes that the cause of death could be determined for 148 of the 1,779 carcasses that were found during transect work conducted from 1998 through 2002 and during line-distance sampling conducted in 2001 and 2002. These data indicate that predation by mammals (71 individuals), crushing by off-highway vehicles (35), predation by common ravens (12), and gunshot (9) accounted for most of the identifiable causes of death on lands managed by the Bureau (see Table L-6 of Appendix L). Based on density values derived from line-distance sampling conducted within the Fremont-Kramer, Superior-Cronese, and Ord-Rodman critical habitat units, Heaton et al. (2004) calculated that approximately 20,420 to 41,224 adult desert tortoises reside in the western Mojave Desert. (The Desert Tortoise Recovery Plan Assessment Committee does not consider the Pinto Mountain Desert Wildlife Management Area to be part of the Western Mojave Recovery Unit [Heaton et al. 2004]; therefore, this range does not include animals from that area.) They arrived at this estimate by multiplying the average density for each critical habitat unit by the acreage of suitable habitat that was sampled within the unit and totaling the results. Note that the sampling excludes areas over 4,200 feet in elevation and playas, where desert tortoises are not expected to live, and private lands, which are not sampled because of lack of access. Desert tortoises that reside within suitable habitat on private lands are not included in the estimate; consequently, the predicted range of the number of desert tortoises may be greater than estimated. Conversely, as we noted previously in this section, the most favorable habitat for desert tortoises occurs between 1,000 and 3,000 feet, therefore, including elevations of up to 4,200 feet in the abundance calculation may result in an overestimate of the number of desert tortoises. Finally, statistical issues with the methodology of line-distance sampling may introduce even greater variances in the estimated total than those shown in the depicted range. Regardless of the variance that may exist in these estimates, they represent the best available scientific and commercial information.

From 1998 to 2001, biologists working for the Bureau surveyed 3,362 transects covering 3,378 square miles in the western Mojave Desert (Bureau et al. 2005). The transects are generally conducted by walking a triangular transect, 0.5 mile on each side, and recording all sign (i.e., scats, burrows, or other evidence of the presence of animals) of desert tortoises. The surveyors did not find any sign of desert tortoises on 1,405 (42 percent) of the transects; the surveyors failed to detect sign in areas where desert tortoises were previously considered to be common. Map 3-8 in the final environmental impact report and statement for the West Mojave Plan (Bureau et al. 2005) depicts the distribution of above-average sign counts; higher sign counts generally indicate the areas that support a higher relative abundance of desert tortoises. The following sections describe the results of work related to the abundance of desert tortoises that

has been conducted within and adjacent to the proposed desert wildlife management areas in the Western Mojave Recovery Unit.

A decline in numbers of desert tortoises in the Western Mojave Recovery Unit can be quantitatively demonstrated. Between 1971 and 1980, 27 plots were established in California to study the desert tortoise; 15 of these plots were used by the Bureau to monitor desert tortoises on a long-term basis (Berry 1999). Generally, the plots were visited at roughly 4-year intervals to determine the numbers of desert tortoises they supported. Desert tortoises found on these plots during the spring surveys were registered; that is, they were marked so they could be identified individually during subsequent surveys. The Desert Tortoise Recovery Plan Assessment Committee (Tracy et al. 2004) evaluated data from long-term study plots in the western Mojave Desert and concluded that the population densities of adult desert tortoises exhibited a significant downward trend ($P < 0.0001$) from approximately 1975 through 2000.

Because management situation within the desert wildlife management areas in the Western Mojave Recovery Unit are generally more complicated than in other areas, we have described the status of the desert tortoise in each area. The following sections describe the status of the desert tortoise within and adjacent to the desert wildlife management areas proposed by the Bureau.

Pinto Mountains Desert Wildlife Management Area

The proposed Pinto Mountains Desert Wildlife Management Area is located in the southeastern portion of the Western Mojave Recovery Unit; Tracy et al. (2004) suggest that it would be more appropriately placed in the Eastern Colorado Recovery Unit; the Bureau manages most of the land within this proposed desert wildlife management area. No permanent study plots are located in this proposed desert wildlife management area. Little information exists on the densities of desert tortoises in this area. Tracy et al. (2004) noted that the distribution of carcasses and live desert tortoises appeared to be what one would expect in a "normal" population of desert tortoises; that is, carcasses occurred in the same areas as live animals and were not found in extensive areas in the absence of live desert tortoises. No higher density areas were found in the proposed Pinto Mountain Desert Wildlife Management Area during the survey work conducted by the Bureau from 1998 to 2001.

The northern portion of Joshua Tree National Park generally lies south of the Bureau's proposed desert wildlife management area. Given the general patterns of visitor use at Joshua Tree National Park, we expect that this area receives little use.

The northern boundary of Joshua Tree National Park and the proposed desert wildlife management area are separated from the southern boundary of the Marine Corps Air Ground Combat Center by an area that is composed primarily of private lands. This region continues to support desert tortoises; the primary threat to desert tortoises in this area is urbanization.

Desert tortoises occur within the Marine Corps Air Ground Combat Center in densities of greater than 50 per square mile in limited areas; most of the installation, however, supports from 0 to 5 animals per square mile (Jones and Stokes Associates 1998 in Natural Resources and Environmental Affairs Division 2001). The Marine Corps' integrated natural resource management plan also notes that the number of desert tortoises may have declined in the more heavily disturbed areas of the Marine Corps Air Ground Combat Center and that vehicles, common ravens, and dogs are responsible for mortalities. In general, the Marine Corps Air Ground Combat Center supports a wide variety of training exercises that include the use of tracked and wheeled vehicles and live fire. The Marine Corps Air Ground Combat Center lies north of the proposed Pinto Mountain Desert Wildlife Management Area and east of the Ord-Rodman Desert Wildlife Management Area.

Ord-Rodman Desert Wildlife Management Area

The proposed Ord-Rodman Desert Wildlife Management Area is located to the southeast of the city of Barstow. The recovery plan notes that the estimated density of desert tortoises in this area is 5 to 150 animals per square mile (Service 1994). During the survey work conducted by the Bureau from 1998 to 2001, the proposed Ord-Rodman Desert Wildlife Management Area contained three higher concentration areas, located in its eastern, northwestern, and southern corners. Three permanent study plots are located within and near this proposed desert wildlife management area. The following table contains the density estimates for these plots; the data are from Berry (1996); all data are in the approximate number of desert tortoises of all sizes per square mile.

	Stoddard Valley	Lucerne Valley	Johnson Valley
1980		176	114
1981	146		
1986		150	80
1987	178		
1990		82	18
1991	225		
1994		73	73

Berry (1996) notes that, for various reasons, surveys at the Stoddard Valley plot encountered various difficulties; some desert tortoises from this plot were taken by poachers and at least one animal became ill with upper respiratory tract disease and contained environmental contaminants. Common ravens and feral dogs have killed desert tortoises at the Lucerne Valley plot; Berry (1996) notes that little recruitment into adult size classes was occurring. Berry (1996) notes that at least two desert tortoises from the Johnson Valley plot were killed by off-road vehicle use or cattle; at least one ill and salvaged animal contained environmental contaminants.

Superior-Cronese Desert Wildlife Management Area

The proposed Superior-Cronese Desert Wildlife Management Area is located north of the Ord-Rodman Desert Wildlife Management Area; two interstate freeways and rural, urban, and agricultural development separate them. No permanent study plots have been established in this area; the density of desert tortoises has been estimated through numerous triangular transects and line distance sampling efforts. The recovery plan notes that this desert wildlife management area supports densities of approximately 20 to 250 desert tortoises per square mile. The survey work conducted by the Bureau from 1998 to 2001 indicated that the western portion of the proposed Superior-Cronese Desert Wildlife Management Area did not contain any high density areas; desert tortoises seemed to be concentrated in the south-central portion of the proposed desert wildlife management area and along portions of the southern boundary of Fort Irwin.

Desert tortoises occur over large areas of Fort Irwin, which is managed by the Department of the Army (Army). At Fort Irwin, the Army conducts realistic, large-scale exercises with large numbers of wheeled and tracked vehicles. In areas where training has occurred for many decades, desert tortoises persist in relatively low numbers primarily on the steep, rugged slopes of the mountain ranges that occur throughout Fort Irwin. Through Public Law 107-107, approximately 118,600 acres were added to Fort Irwin along its southwestern and eastern boundaries in 2002. Approximately 97,860 acres of the Superior-Cronese Critical Habitat Unit lie along the original southern boundary of Fort Irwin and in the parcel to the southwest that was added in 2002 (Charis Professional Services Corporation 2003, Army 2004). Currently, the Army may conduct some low intensity training in these areas on occasion and some preparations for the onset of force-on-force training should begin soon. To date, these parcels have not been used for force-on-force training; within the next few years, the Army will begin to use a large portion of these lands for maneuvers with numerous wheeled and tracked vehicles. In our biological opinion regarding the effects of the use of these lands for training on the desert tortoise (Service 2004), we noted that approximately 1,299 to 1,349 adult desert tortoises may occur within the action area for that consultation. The Army established several conservation areas, totaling approximately 16,900 acres, just inside the boundaries of Fort Irwin where maneuvers would not occur. The Army calculated that approximately 152 desert tortoises may reside within these areas; these animals are unlikely to be affected by use of the new training lands. Additionally, because of other restrictions that the Army will follow during training, approximately 5,500 acres of critical habitat of the desert tortoise within the additional training lands will not be used for force-on-force training. These lands lie primarily on and around dry lakes, which generally do not support large numbers of desert tortoises, because the lake beds themselves do not provide suitable habitat and the areas immediately surrounding the playas usually support substrates composed of clays and silt that are not suitable for burrowing. Finally, in the Eastgate portion of Fort Irwin, approximately 288 desert tortoises may be exposed to additional training; however, most of these animals are located in an area that is unlikely to receive much use by vehicles and are thus unlikely to be affected. The Army and Service have agreed that desert tortoises within new training areas that are likely to be killed by maneuvers will be translocated to newly acquired lands to the south of Fort Irwin; a plan for this translocation is currently under development.

The Navy has designated approximately 200,000 acres of the South Range at the Naval Air Weapons Station, China Lake as a management area for the desert tortoise (Service 1995). This area is generally located to the west of Fort Irwin. Through a consultation with the Service (1992), the Navy agreed to try to direct most ground-disturbing activities outside of this area, to use previously disturbed areas for these activities when possible, and to implement measures to reduce the effects of any action on desert tortoises. This area also encompasses the Superior Valley Tactical Bombing Range located in the southernmost portion of the Mojave B South land management unit of the Naval Air Weapons Station; it continues to be used as an active bombing range for military test and training operations by the Navy and Department of Defense. In the 3 years for which we had annual reports available, activities conducted by the Navy did not kill or injure any desert tortoises (Navy 1995, 2001, 2002). In general, desert tortoises occur in low densities on the North Range of the Naval Air Weapons Station; Kiva Biological Consulting and McClenahan and Hopkins Associates (in Service 1992) reported that approximately 136 square miles of the North Range supported densities of 20 or fewer desert tortoises per square mile. The South Range supported densities of 20 or fewer desert tortoises per square mile over an area of approximately 189 square miles and densities of greater than 20 per square mile on approximately 30 square miles. The higher elevations and latitude in this area may be responsible for these generally low densities (Weinstein 1989 in Bureau et al. 2005).

Fremont-Kramer Desert Wildlife Management Area

The proposed Fremont-Kramer Desert Wildlife Management Area is located west of the Superior-Cronese Desert Wildlife Management Area; the two desert wildlife management areas are contiguous. The recovery plan notes that the estimated density of desert tortoises in this area was 5 to 100 animals per square mile (Service 1994). The southern portion supported the vast majority of the high density areas in the proposed Fremont-Kramer Desert Wildlife Management Area, as determined during the survey work conducted by the Bureau from 1998 to 2001.

Five permanent study plots are located within this proposed desert wildlife management area; one plot, the Interpretive Center plot at the Desert Tortoise Natural Area, is split into two subplots. The following table contains the density estimates for these plots; the data are from Berry (1996); all data are in the approximate number of desert tortoises of all sizes per square mile.

	Fremont Valley	Desert Tortoise Natural Area, Interior	Desert Tortoise Natural Area, Interpretive Center		Fremont Peak	Kramer Hills
			Inside Fence	Outside Fence		
1979		387	339	296		
1980					99	223
1981	278					
1982		332				314

1985			229	134	45	
1987	179					130
1988		195				
1989			106	80	32	
1991	101					60
1992		47				
1993			61	42	8	
1995						139
1996		18				
1997		8*	34#	23#		
2001	19*					
2002			28#	10#		

* These values represent the actual numbers of desert tortoises found on the plot and do not represent a density estimate; the data are from Berry (2005).

These data are from Connor (2003).

Berry (1996) notes that the overall trend in this proposed desert wildlife management area is “a steep, downward decline” and lists predation by common ravens and domestic dogs, off-road vehicle activity, illegal collecting, upper respiratory tract disease, and environmental contaminants as contributing factors.

The Indian Wells Valley, which is located to the southwest of the Naval Air Weapons Station, likely supported desert tortoises at higher densities in the past. Urban, suburban, and agricultural development in this area is likely cause of the lower densities that are currently found in this area.

Edwards Air Force Base, which is located in the southwestern portion of the recovery unit, is used primarily to test aircraft and weapons systems used by the Department of Defense. Desert tortoises occur over approximately 220,800 acres of the installation. Approximately 80,640 acres of the base have been developed for military uses or are naturally unsuitable for use by desert tortoises, such as Rogers and Rosamond dry lakes. Based on surveys conducted between 1991 and 1994, approximately 160,640 acres of the base supported 20 or fewer desert tortoises per square mile. Approximately 55,040 acres supported densities between 21 and 50 desert tortoises per square mile; from 51 to 69 desert tortoises per square mile occurred on several smaller areas that totaled 5,120 acres (U.S. Air Force 2004). We expect that current densities are somewhat lower, given the regional declines in desert tortoise numbers elsewhere in the Western Mojave Recovery Unit.

Desert tortoises may have been more common in the past the area west of Highway 14 between the town of Mojave and Walker Pass; high levels of off-road vehicle use and extensive livestock grazing are potential causes for the current scarcity of desert tortoises in this area. Four townships of private land east of the city of California City and south of the Rand Mountains

supported large numbers of desert tortoises as late as the 1970s; high levels of off-road vehicle use, extensive grazing of sheep, scattered development, and possibly poaching have greatly reduced the density of desert tortoises in this area.

The direct and indirect effects of urban and suburban development extending from Lancaster in the west to Lucerne Valley to the south have largely eliminated desert tortoises from this area. A few desert tortoises remain on the northern slopes of the San Bernardino Mountains, south of Lucerne Valley; however, they seem to be largely absent from the portion of this area in Los Angeles County (Bureau et al. 2005).

Recovery Plan for the Desert Tortoise

The recovery plan for the desert tortoise is the basis and key strategy for recovery and delisting of the desert tortoise. The recovery plan divides the range of the desert tortoise into 6 distinct population segments or recovery units and recommends the establishment of 14 desert wildlife management areas throughout the recovery units. Within each desert wildlife management area, the recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The recovery plan also recommends that desert wildlife management areas be designed to follow the accepted concepts of reserve design and be managed to restrict human activities that negatively affect desert tortoises (Service 1994). The delisting criteria established by the recovery plan are:

1. The population within a recovery unit must exhibit a statistically significant upward trend or remain stationary for at least 25 years;
2. Enough habitat must be protected within a recovery unit or the habitat and desert tortoises must be managed intensively enough to ensure long-term viability;
3. Populations of desert tortoises within each recovery unit must be managed so discrete population growth rates (λ) are maintained at or above 1.0;
4. Regulatory mechanisms or land management commitments that provide for long-term protection of desert tortoises and their habitat must be implemented; and
5. The population of the recovery unit is unlikely to need protection under the Endangered Species Act in the foreseeable future.

The recovery plan based its descriptions of the six recovery units on differences in genetics, morphology, behavior, ecology, and habitat use over the range of the Mojave population of the desert tortoise. The recovery plan contains generalized descriptions of the variations in habitat parameters of the recovery units and the behavior and ecology of the desert tortoises that reside in these areas (pages 20 to 22 in Service 1994). The recovery plan (pages 24 to 26 from Service 1994) describes the characteristics of desert tortoises and variances in their habitat, foods,

burrow sites and phenotype across the range of the listed taxon. Consequently, to capture the full range of phenotypes, use of habitat, and range of behavior of the desert tortoise as a species, conservation of the species across its entire range is essential.

Assessment of the Recovery Plan

In 2003, the Service appointed a group of researchers to conduct a scientific assessment of the recovery plan for the desert tortoise, which was completed in 1994. This group, called the Desert Tortoise Recovery Plan Assessment Committee, completed its assessment in 2004. The group found that the recovery plan was “fundamentally sound, but some modifications for contemporary management will likely make recovery more successful” (Tracy et al. 2004). The group also found that analyses showed desert tortoise populations were declining in some portions of the range, assessing the density of desert tortoises is difficult, and “the original paradigm of desert tortoises being recovered in large populations relieved of intense threats may be flawed...” (Tracy et al. 2004). Finally, the group reviewed the distinct population segments (or recovery units) described in the recovery plan and concluded they should be modified; briefly, the Desert Tortoise Recovery Plan Assessment Committee recommends leaving the Western Mojave and Upper Virgin River units intact and recombining the remaining four into three distinct population segments.

The Service subsequently determined that the recovery plan for the desert tortoise should be revised, with a substantial level of input from stakeholders. To date, the actual revision of the recovery plan has not been initiated.

Recent Fires

Since December 2004, numerous wildfires have occurred in desert tortoise habitat across its range. Although we know that some desert tortoises were killed by the wildfires, mortality estimates are not available at this time. We estimate that approximately 500,000 acres of potential desert tortoise habitat burned in the Northeastern Mojave Recovery unit in 2005. This number includes areas of critical habitat that burned, which are noted in the following table. All data are from Clayton (2005).

Recovery Unit	Critical Habitat Unit	Acres Burned
Upper Virgin River	Upper Virgin River	10,446
Northeastern Mojave	Beaver Dam Slope	46,757
Northeastern Mojave	Gold Butte-Pakoon	62,466
Northeastern Mojave	Mormon Mesa	15,559
Eastern Mojave	Piute-Eldorado	154
Eastern Mojave	Ivanpah	1,065
Total		136,447

The 136,447 acres of critical habitat that burned represent approximately 2.1 percent of the total amount of critical habitat that was designated for the desert tortoise. Given the patchiness with

which the primary constituent elements of critical habitat are distributed across the critical habitat units and the varying intensity of the wildfires, we cannot quantify precisely the extent to which these fires disrupted the function and value of the critical habitat.

ENVIRONMENTAL BASELINE

Action Area

The implementing regulations for section 7(a)(2) of the Act define the action area to be "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." We have determined that the action area for this consultation is the 314.6-acre site.

Habitat Characteristics of the Action Area

The following information is from the habitat conservation plan (Circle Mountain Biological Consultants and Yacoubian Law Offices 2006). Elevations range from 2,720 feet in the west-central portion of the site to 2,440 feet near the southeast and near the northeast corners. Several washes converge and exit the site near its northeast corner.

Evidence of human disturbance on the site included off-highway vehicle tracks, shotgun and rifle casings and targets, roads, dumps, dogs, and trails. Disturbance varied from light to heavy. The dumps included some very large sites that contained abandoned cars, appliances, and other material.

Creosote bush (*Larrea tridentate*) is the dominant plant on the site. Other perennial plants include cheesebush (*Hymenoclea salsola*), senna (*Senna armata*), paper-bag bush (*Salazaria mexicana*), indigo bush (*Psoralea schottii*), silver cholla (*Opuntia echinocarpa*), pencil cholla (*O. ramosissima*), rayless encelia (*Encelia frutescens*), and bush sunflower (*E. virginensis*). Vegetation at the higher elevations on the rocky slopes and hilltops included California buckwheat (*Eriogonum inflatum*), rhatany (*Krameria erecta*), brittlebush (*Encelia farinosa*), and fagonia (*Fagonia laevis*).

Status of the Desert Tortoise in the Action Area

The following information is from the habitat conservation plan (Circle Mountain Biological Consultants and Yacoubian Law Offices 2006). Circle Mountain Biological Consultants surveyed the site in August 2003. Six adult desert tortoises were seen on the site. Desert tortoise sign observed included 1,114 carcasses, 3,337 burrows, 256 scat, and two sets of tracks. Most of the carcasses were found on the rocky hillsides overlooking the flats. Common ravens or other predators or scavengers likely moved many of these carcasses to the rock outcrops from the nearby flat areas. The highest concentration of other sign was found in the northeastern parts of

the site, with additional concentrations along the main wash that runs northeast through the central portion of the site. Several of the desert tortoises had damage to the gular area of the plastron, which is characteristic of mauling by dogs.

EFFECTS OF THE ACTION

Four general aspects of the proposed action may affect desert tortoises within the action area. These aspects are the capture and relocation of any desert tortoises that may be in work areas, the actual construction of the new facilities and removal of dumps, use of the campground, and miscellaneous activities. We will discuss these aspects in the following paragraphs.

Capture and Relocation of Desert Tortoises

Some potential exists that capturing desert tortoises may cause elevated levels of stress that may render these animals more susceptible to disease or predation. Desert tortoises occasionally urinate when they are handled (Jacobson et al. 1993 in Averill-Murray 2002); this loss of water "could result in serious health threats or compromise normal behavior or physiology, especially during hot, dry summer months" (Averill-Murray 2002). Averill-Murray (2002) found that the rate of survival decreased if desert tortoises urinated during handling. Berry et al. (2002) speculate that procedures such as weighing, measuring, and photographing in a short period of time are less stressful than more invasive handling, such as notching the shell, attaching transmitters, and drawing blood.

JAT Associates has proposed to use only experienced biologists approved by the Service. Additionally, the handling would only involve activities that are less invasive than those Berry et al. (2002) considered to be minimally stressful. The likelihood that the stress levels of handled desert tortoises may be substantially elevated or that they may urinate will likely be minimized to the maximum degree possible. Consequentially, the amount and manner of handling proposed by JAT Associates are unlikely to injure or kill desert tortoises.

Relocated desert tortoises occasionally travel long distances to return to the site from which they were removed; they may be at greater than normal risk from environmental conditions and predators during such long-distance movements over unfamiliar terrain. Because the areas to be disturbed in this proposed action are relatively small in relation to the home ranges of desert tortoises, we anticipate that any translocated animals are highly unlikely to be moved to areas that are outside their existing ranges. Consequently, moving desert tortoises these short distances is unlikely to expose them to substantial added risk. Additionally, their familiarity with the area may assist in reducing their level of stress.

Even in a worst-case scenario (that is, translocated desert tortoises are subjected to elevated levels of stress and attempt to return to capture sites), we anticipate that an extremely low number of animals that are likely to be affected by the proposed action. We base this statement

on the fact that only six desert tortoises were detected on the project site. Although additional desert tortoises may enter the area before construction begins, we do not anticipate that the number of animals present in the work area will increase substantially.

JAT Associates has requested that the Service condition the incidental take permit to allow it to handle no more than 31 desert tortoises over the life of the permit; we note that handling the same individual twice would be considered as handling 2 desert tortoises for tracking purposes. Although we in no way condone the casual handling of desert tortoises, we have experienced incidents in the past where project managers were reluctant to handle desert tortoises that were at risk because they did not want to use up their handling limit; subsequently, these or other animals were killed or injured because they were not moved from harm's way. Given the low degree of risk involved with the handling of a desert tortoise by a knowledgeable person, limiting the number of individuals that can be handled in the course of moving them from harm's way over the life of the permit may not be particularly protective; in fact, this limitation may increase the exposure of desert tortoises to greater risk.

Construction of the New Facilities and Removal of Dump Sites

JAT Associates has proposed to employ qualified, Service-authorized biologists to survey the site of the proposed facilities prior to construction. Any desert tortoise that is found during the survey will be moved to a portion of the property that will not be developed. Additionally, a relatively small portion of the site would be disturbed by construction; the areas that would be disturbed are somewhat dispersed, which increases, to some degree, the likelihood that desert tortoises will be found prior to construction of any given facility.

For these reasons, we anticipate that desert tortoises are unlikely to be killed or injured by heavy equipment or workers during construction of the new facilities. Juvenile desert tortoises are difficult to detect during surveys; therefore, the potential exists that they may be missed during the surveys and remain in the work areas during construction. Given that the area of disturbance is relatively small, the likelihood that juveniles may be killed is relatively low.

Noise and vibration created by construction activities may alter the behavior of desert tortoises in some manner. This effect would be temporary, occurring for the relatively short time that construction is underway. We also anticipate that, because the work areas are small, few desert tortoises will be affected by noise and vibration generated by the proposed action.

Desert tortoises have occasionally been found residing within piles of trash and under large discarded items, such as cars, in the western Mojave Desert. Heavy equipment being used to remove such debris from the site could kill or injure desert tortoises. We anticipate that such occurrences within the action area would not be common, given that Circle Mountain Biological Consultants did not report any such behavior, despite its thorough surveys of the action area.

Approximately 13.8 acres of desert tortoise habitat would be permanently disturbed by the proposed activity during the construction of the new facilities. The loss of this area will not

substantially reduce the habitat that is available within the region for desert tortoises to breed, feed, seek shelter, or conduct other necessary ecological functions.

Use of the Campground

The effects related to use of the campground would occur primarily through its general operation and maintenance and use of its trails. Workers and visitors are likely to encounter desert tortoises that wander into or near the various facilities. Because of the educational programs proposed by JAT Associates, we do not expect that desert tortoises will be killed or injured maliciously or carelessly. Consequently, we expect few desert tortoises to be killed or injured in this manner.

Some potential exists that desert tortoises may be encountered during maintenance activities. For example, desert tortoises may take shelter under maintenance vehicles or campground facilities; such animals may be killed or injured if they are not detected and the maintenance requires the use of heavy equipment. The habitat conservation plan does not specifically address protective measures that would be implemented during routine maintenance of the campground; however, the general education programs that will be provided to workers are likely to prevent numerous mishaps of this nature.

With few exceptions, only pedestrians, electric golf carts, mountain bikes, and horses would be allowed on trails within the action area; consequently, we expect that few desert tortoises are likely to be killed or injured. To a great degree, people using these modes of movement travel at lower speed, have greater visibility, and project a smaller footprint than those in motor vehicles. Juvenile desert tortoises are generally difficult to see at any speed with any mode of travel; consequently, they will remain at some risk of being killed or injured on trails. We expect that, given the overall low number of desert tortoises in the area, the small portion of the action area that would be used for trails, and the speed limits that would be enforced on the trails, few juvenile desert tortoises are likely to be killed or injured. Although desert tortoises may be active during any season, the risk of striking them on trails is much greater during the spring and fall when desert tortoises are most active.

The habitat conservation plan also notes that Service and emergency response vehicles may also use the trails, when necessary. Most service vehicles would be golf carts; these vehicles would use the trails on a daily basis (Lechuga 2006). JAT Associates noted that trucks would be used during certain repair projects or to deliver large objects throughout the campground; it anticipates that trucks would use the trails on a monthly basis (Lechuga 2006). Although trucks and emergency vehicles would be more likely to strike desert tortoises because of the reduced visibility associated with these vehicles and possibly greater speed, we expect few, if any, desert tortoises to be killed by such vehicles because this type of use is likely to occur infrequently.

The access road to the campground and the entire parking area will be fenced to preclude entry by desert tortoises. A limited potential exists for desert tortoises to enter the access road through the gate to the campground. We consider such an event to be unlikely, given the relatively small

size of the gate in relation to the edge of the property. Also, speed limits will be enforced along the access road. Consequently, we do not anticipate desert tortoises are likely to be killed or injured by its use.

We do not anticipate that many desert tortoises are likely to be killed or injured during use of the campground. We base this conclusion on the assumptions that the campground will not support large numbers of animals over the life of the incidental take permit and that the education programs and other protective measures will be effective. Given the 30-year term of the incidental take permit, the variability in the numbers of desert tortoises that may be present, and the likely effectiveness of the protective measures, we cannot predict how many desert tortoises are likely to be killed or injured over this time period.

Miscellaneous Effects

JAT Associates has proposed many measures to attempt to avoid, minimize, or reduce other adverse effects that are often associated with construction projects in the desert. For example, trash and food items will be disposed of appropriately in predator-proof containers to reduce the attractiveness of the area to common ravens. JAT Associates will also eliminate perches for common ravens throughout the property and, if necessary, will hire a qualified biologist holding appropriate depredation permits to allow for removal of common ravens and their nests. Workers will be briefed on the status of the desert tortoise and the measures being implemented as part of the proposed action to ensure they do treat individuals of the species in an appropriate manner. Visitors bringing dogs to the campground will be required to follow strict procedures to ensure that their pets do not kill or injure desert tortoises.

The removal of trash dumps and other restoration actions proposed by JAT Associates will likely improve habitat conditions within the action area. Such improved habitat conditions may, to some degree, improve the physical condition of desert tortoises on site. The perimeter fencing and on site management proposed by JAT Associates is likely to reduce the amount of unauthorized disturbance occurring within the action area and, again, promote the conservation of desert tortoise habitat onsite; it should also substantially reduce the likelihood that desert tortoises would be killed or injured by unauthorized activities.

Summary

JAT Associates has proposed numerous measures to avoid, minimize, or reduce the adverse effects on the desert tortoise of the proposed action. Consequently, we expect that few desert tortoises will be killed or injured by project activities over the 30-year life of the permit.

The habitat conservation plan notes that JAT Associates will contact the Service if four desert tortoises are killed or injured within the permit term. At that point, JAT Associates will work with the Service to avoid additional injuries or mortalities until the Service determines whether a

permit amendment is appropriate. This threshold will ensure that our qualitative assessment, specifically that few desert tortoises are likely to be killed or injured by development and operation of the campground, is not exceeded.

The loss of 13.8 acres of suitable habitat will not substantially reduce the reproduction, numbers, or distribution of the species in the wild. The management of 13.8-acre mitigation area, along with that of an additional 287 acres for the conservation of the desert tortoise, will benefit individuals that reside in the area by providing them with habitat from which most anthropogenic sources of mortality have been removed.

Given the vast areas that the recovery plan (Service 1994) recommends be managed for the recovery of the desert tortoise, the generally urbanizing nature of the area of this region, and the amount of unauthorized activity occurring in the general vicinity, we anticipate that, at some point in the future, desert tortoises may be extirpated from the general vicinity of the project area, despite the best efforts of JAT Associates. We have reached this conclusion, in part, because desert tortoises are unlikely to remain within the fenced area of the campground for their entire lives and will be at greater risk of being killed or injured outside of the fenced area.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The incidental take permit under consideration would cover the entire action area. Consequently, we are not aware of any future actions that are reasonably certain to occur. Any future actions considered by JAT Associates would be subject to the provisions of the Service's incidental take permit and the habitat conservation plan.

CONCLUSION

After reviewing its current status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the proposed issuance of an incidental take permit, pursuant to section 10(a)(1)(B) of the Act, for the construction and operation of a campground by JAT Associates is not likely to jeopardize the continued existence of the desert tortoise. We reached this conclusion because the proposed action will affect a very limited number of desert tortoises and only 13.8 acres of suitable habitat; additionally, JAT Associated has proposed numerous measures to avoid, minimize, reduce, and offset the potential adverse effects of the action on the desert tortoise.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined

as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described in this incidental take statement are non-discretionary and must be undertaken by the Service or made binding conditions of any incidental take permit provided to JAT Associates. The Service has a continuing duty to regulate the activities covered by this incidental take statement. If the Service fails to assume and implement the terms and conditions of the incidental take statement or to make them enforceable terms of its incidental take permit, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Service must monitor the progress of its incidental take permit and its impact on the species as specified in the incidental take statement (50 *Code of Federal Regulations* 402.14(i)(3)). We also note that, because the Service considered the effects of the protective measures proposed by JAT Associates in the habitat conservation plan (Circle Mountain Biological Consultants and Yacoubian Law Offices 2006) in its analysis of the proposed action, these measures are also non-discretionary.

We anticipate that few desert tortoises are likely to be killed or injured during the construction and operation of the proposed campground. The habitat conservation plan notes that JAT Associates will contact and work with the Service if four desert tortoises are killed or injured within the permit term. Based on this provision of the habitat conservation plan that will be carried forward in the incidental take permit, we anticipate that the injury or mortality of four desert tortoises will prompt re-initiation of intra-Service consultation.

We anticipate that the number of desert tortoises that are likely to be captured and moved out of harm's way during the life of the incidental take permit may exceed the 31 desert tortoises described in the habitat conservation plan. As we discussed in the Effects of the Action, Capture and Relocation of Desert Tortoises section of this biological opinion, the amount and manner of handling proposed by JAT Associates are unlikely to injure or kill desert tortoises; furthermore, limiting the number of individuals that can be handled in the course of moving them from harm's way over the life of the incidental take permit may expose desert tortoises to greater risk. Consequently, we anticipate that more than 31 desert tortoises may be captured and handled during the life of the incidental take permit. Given the great degree of variance in the number of desert tortoises that may be present in the action area during the life of the incidental take permit and the unpredictability of when they need to be moved from harm's way, we cannot predict

how many individuals may be handled. Because the type of handling proposed by JAT Associates is highly unlikely to kill or injure desert tortoises or to cause them undue stress, we are not considering the capture of 31 desert tortoises as a threshold that must prompt re-initiation of formal consultation. All desert tortoises within the action area that are in harm's way may be captured and moved to safety.

The exemption from the section 9 prohibitions against take provided by this incidental take statement extends only to the 314.6-acre project area.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of desert tortoises during construction, restoration, and operation of the Joshua Tree Recreational Campground Site:

1. The Service must ensure that desert tortoises are protected during restoration activities conducted at the project site.
2. The Service must ensure that desert tortoises are not placed at undue risk during construction, restoration, and operation of the campground.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described in the previous section, and the reporting and monitoring requirements. These conditions are non-discretionary.

1. The following term and condition implements reasonable and prudent measure 1:

The Service must condition the incidental take permit to include pre-work surveys of, removal of desert tortoises from, and monitoring of all restoration activities during which heavy equipment is used. The intent of this term and condition is to treat all restoration activities during which desert tortoises may be killed or injured in the same basic manner that construction activities are treated in the habitat conservation plan.

2. The following terms and conditions implement reasonable and prudent measure 2:

- a. The Service must condition the incidental take permit to remove the limit of 31 desert tortoises that can be moved from harm's way, as proposed in the habitat conservation plan.

- b. The Service must condition the incidental take permit to require that JAT Associates use qualified biologists authorized by the Service to instruct appropriate employees of the campground to remove desert tortoises from harm's way during routine operations of the campground. Such instruction must be provided by a qualified desert tortoise biologist to appropriate campground employees and must include training on when moving a desert tortoise is appropriate, how to handle desert tortoises, how to select appropriate sites to which to move them when they are at risk as a result of routine operation of the campground, and the necessary information to gather to meet the reporting requirements of the incidental take permit. We define "appropriate campground employees" as workers at the campground who are routinely present on-site and are familiar with its day-to-day operations.

REPORTING REQUIREMENTS

The habitat conservation plan describes the information that JAT Associates must report within 90 days of completion of monitoring activities and annually. The information includes records of all desert tortoises observed and moved during project activities, and quantification of the amount of habitat disturbance. The report must also contain an evaluation of the impacts to desert tortoises resulting from the construction activities, address the appropriateness of the minimization and mitigation measures and make recommendations as to how the measures may need to be changed for construction of future phases. The annual reports will also include a cumulative total of the number of desert tortoises taken, changed circumstances encountered, adaptive management implemented, and any other problems or relevant information. We have no further information to request from the Service or JAT Associates at this time.

DISPOSITION OF DEAD OR INJURED DESERT TORTOISES

The habitat conservation plan describes procedures that will be implemented if a dead or injured desert tortoise is found; these procedures include the collection of information about the incident, time lines for reporting to the Ventura Fish and Wildlife Office and California Department of Fish and Game, and the procedures for treating injured animals.

The Ventura Fish and Wildlife Office must notify the Service's Division of Law Enforcement within 3 days of being notified of any dead or injured desert tortoises by JAT Associates. The Service must also condition the incidental take permit to ensure that JAT Associates handles dead specimens such that biological material is preserved in the best possible state for later analysis. The remains of desert tortoises must be placed with the U.S. Geological Survey (Contact: Kristin Berry, U.S. Geological Survey, 22835 Calle San Juan De Los Lagos, Moreno Valley, California 92553, (951-697-5361); if the U.S. Geological Survey does not want the carcass because the damage is too extensive, the carcass must be disposed of in an appropriate manner.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

As we noted in the Effects of the Action section of this biological opinion, we envision that future human uses of the area around the campground may result in the local extirpation of desert tortoises. For this reason, we recommend that the Service include a statement in the incidental take permit to JAT Associates that discusses the potential benefits of extending desert tortoise-proof fencing around the outside borders of its property at some point in the future when recreational use and development in the surrounding areas threaten the persistence of desert tortoises on a local scale. We recommend that this statement clearly indicate to JAT Associates that: the installation and maintenance of such a fence would be voluntary on its part; the Service would assist in securing any necessary revisions to compliance with the Endangered Species Act. Although small reserves such as JAT Associates could offer may not directly further the recovery of the desert tortoise, they may provide a humane alternative to caring for individuals that are endangered by development. Eventually, such small reserves may provide a source of individuals for general recovery actions; the revised recovery plan that the Service is beginning to develop will likely address such issues.

REINITIATION NOTICE

This concludes formal consultation on the proposed issuance of an incidental take permit to JAT Associates for the construction and operation of a campground near the community of Joshua Tree. Reinitiation of formal consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Ray Bransfield of my staff at (805) 644-1766, extension 317.

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